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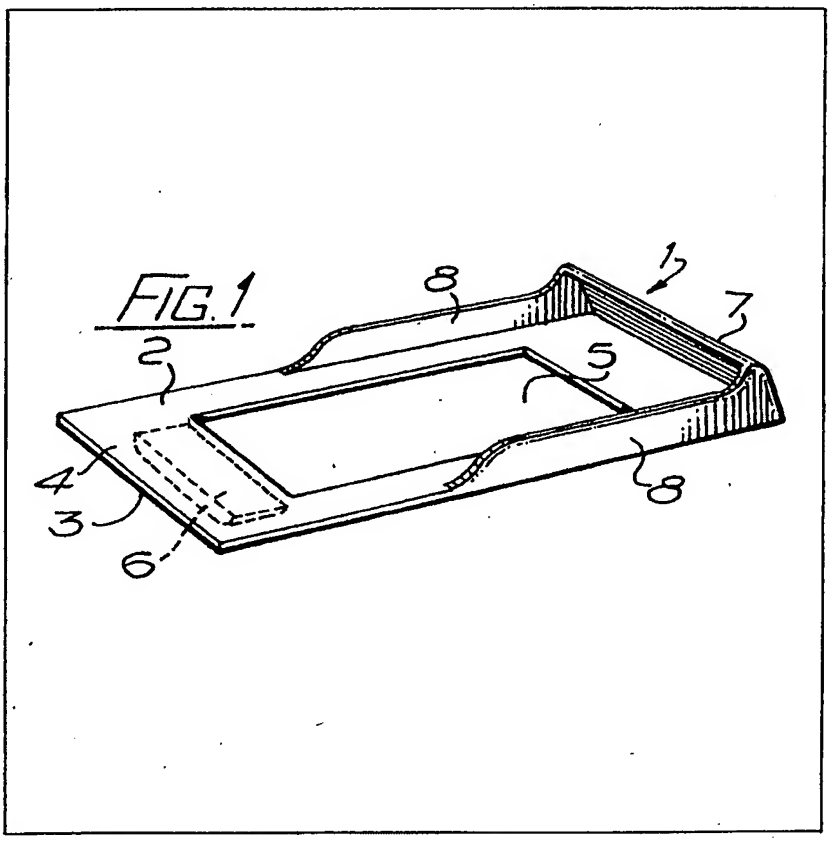
(54) A retention seal for mineral cutter picks and boxes

(57) A retention seal 1 for interposing between a mineral cutter pick having a shank and an enlarged head, and an apertured box, comprises a generally planar base 2 provided with a hole 5 extending from an undersurface 3 of the base 2, and serving, in use, to fit closely around the pick shank adjacent the enlarged head, and a resilient pad 6 projecting away from the undersurface 3 and serving, in use, to snap into a void defined between the pick shank and a front of the box aperture after the shank has been moved rearwardly to cause interaction of co-operating elements, to retain the pick within the box. The base 2 may be of metal or plastics material and have bonded thereto the resilient pad.



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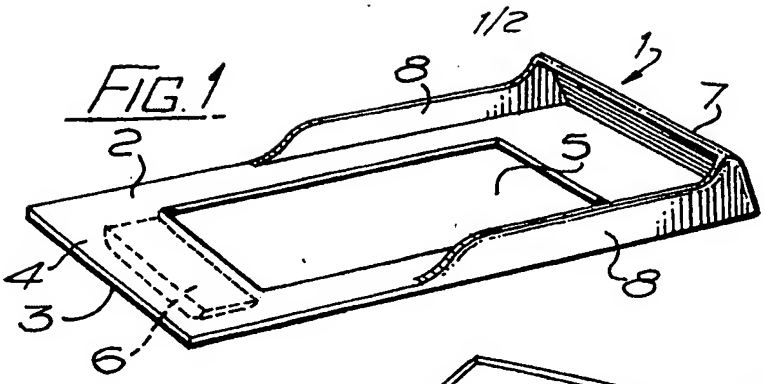

FIG. 1

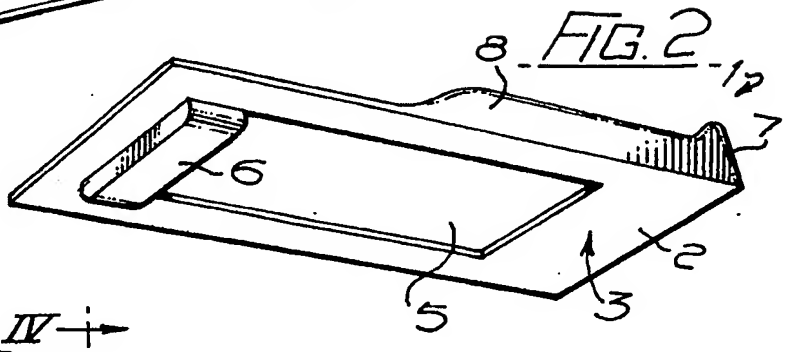

FIG. 2

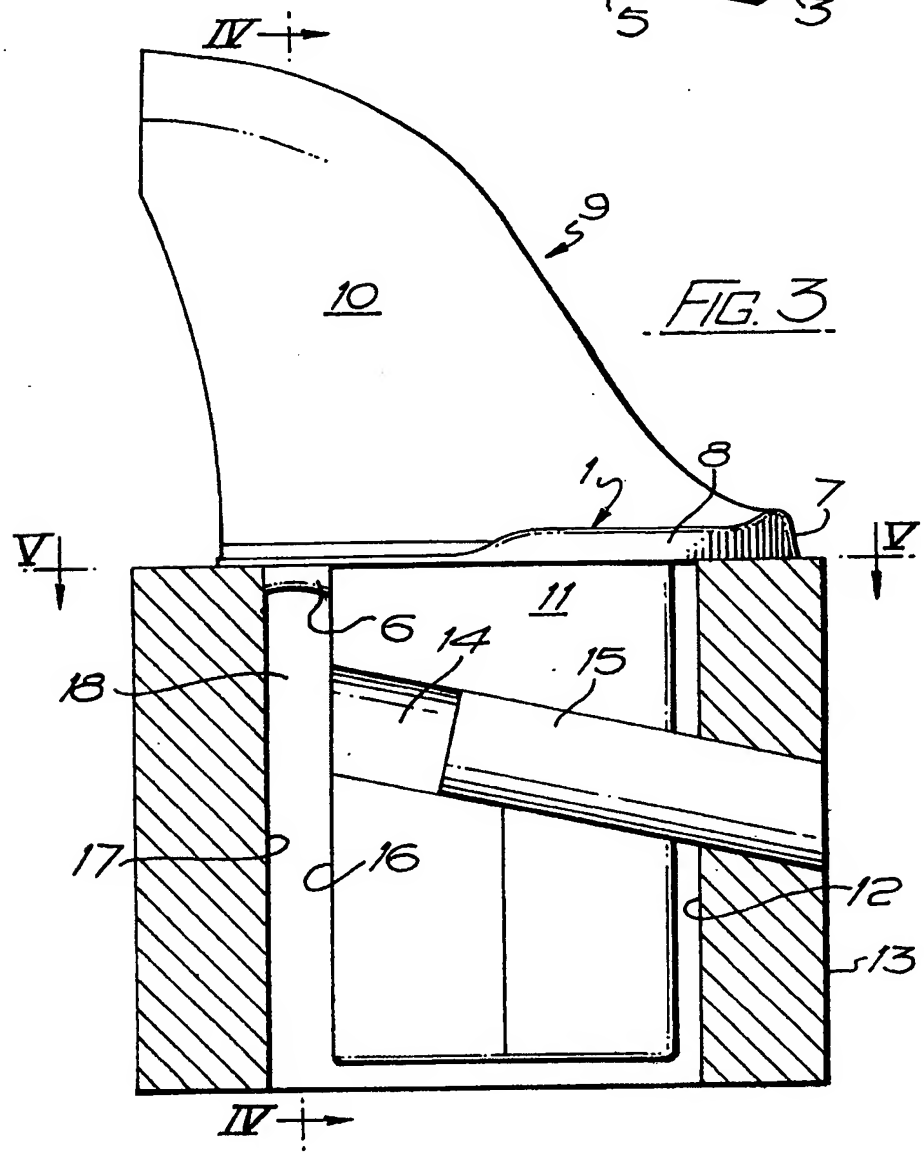

FIG. 3

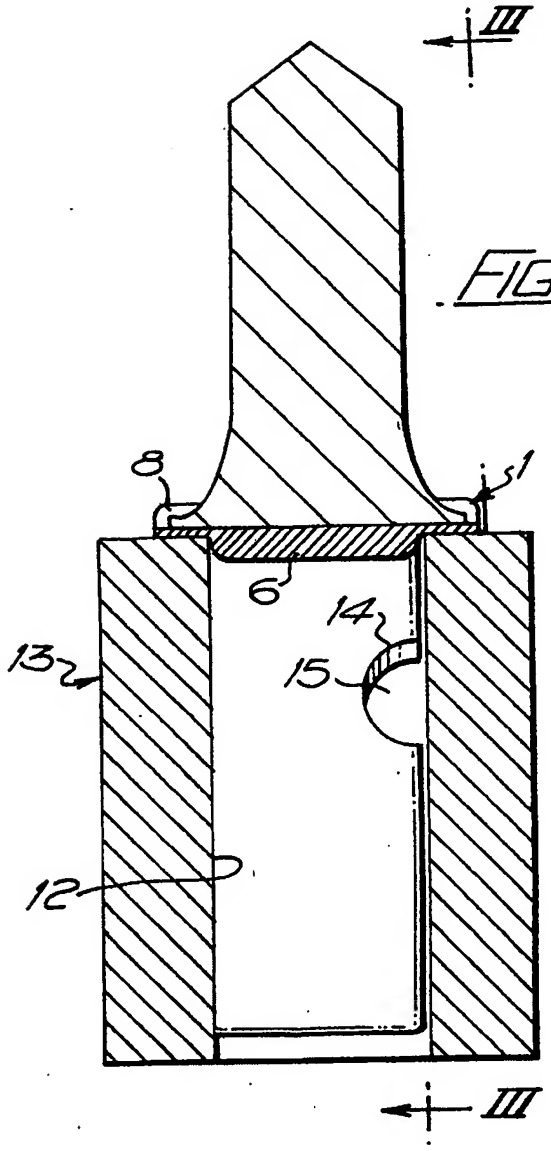

FIG.4

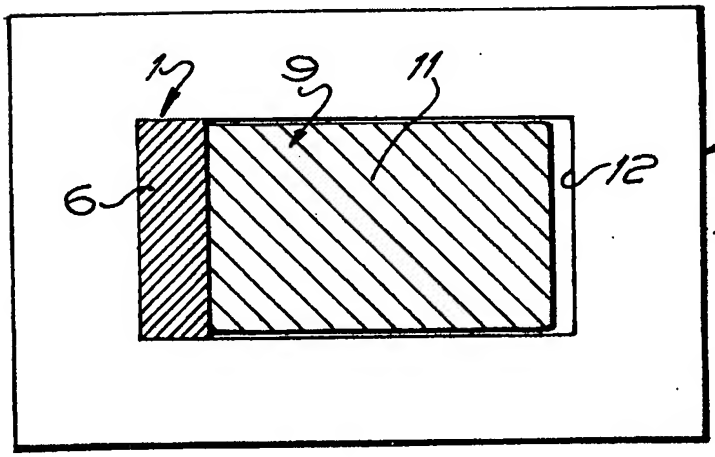

FIG.5

SPECIFICATION

Locking and sealing shoe for mineral cutter picks and boxes

This invention relates to a retention seal for a mineral cutter pick and box combinataion, and to such combination when provided with the retention seal. By a mineral cutter pick and box combination is meant a shanked pick releasably secured to an apertured box by inserting the shank at the front of the socket (relative to the direction of cutting movement), the pick being retained by being moved rearwardly to enable co-operating elements of the aperture and of the shank to engage with each other.

While the pick is being displaced in the cutting direction, the forces on the pick tend to urge the shank rearwardly relative to the aperture, thus enhancing the retentive action of the co-operating elements.

However, if the direction of movement of the pick and box is reversed and the pick encounters any object, the pick will tend to be moved forwardly relative to the box and the co-operating elements disengaged, so that a box often unintentionally looses its pick under the influence of gravity and/or vibration and/or centrifugal force.

Furthermore, rearward movement of the pick with respect to the box, to achieve retention, results in the creation of a void between the shank and the front of the aperture, which void, in service, often becomes clogged with dirt, debris etc., resulting in the impossibility of moving the pick forward relative to the box, thus preventing disengagement of the co-operating elements from each other, and thereby preventing replacement of a damaged and/or worn pick by a fresh one.

According to the present invention there is provided a retention seal for interposing between a mineral cutter pick, having a shank and an enlarged head, and an apertured box, the seal having a generally planar base provided with a hole extending from an undersurface of the base to an upper surface of the base, and serving, in use, to fit closely around the pick shank adjacent the enlarged head, and a resilient pad projecting away from the undersurface of the base and serving, in use, to snap into a void defined between the pick shank and a front of the box aperture after the shank has been moved rearwardly to cause interaction of co-operating elements to retain the pick within the aperture of the box.

The invention also includes a mineral cutter pick, and also a mineral cutter pick and box combination, provided with a retention means as defined above.

The seal may be provided with a lip or lips for embracing the rear and/or side portions of the enlarged head adjacent the shank, to assist firstly location of the seal on the pick and secondly movement of the seal with the pick relative to the box, at least during movement of the pick rearwardly relative to the box. Alternatively, or in addition, the seal may be bonded to the enlarged head, and the hole in the seal may be an interference fit on the pick shank.

The seal may be formed of metal or plastics material and have bonded thereto a resillent pad, e.g. of polyurethane, or the entire seal may be formed integrally, e.g. of polyurethane, which may have a harder grade for the base than for the pad.

The base of the seal may be flat or may be provided with ridges for engaging the pick and/or the box.

The invention will now be further described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a top perspective view;

Figure 2 is an underneath perspective view;

Figure 3 is a part sectional side elevation on the line III—III of Figure 4;

Figure 4 is a part sectional end elevation on the line IV—IV of Figure 3, and

Figure 5 is a part sectional plan view on the line V—V of Figure 3.

In the drawings, a retention seal in accordance with the invention is indicated at 1, and comprises a generally planar base 2 having an undersurface 3 and an uppersurface 4. An aperture 5 extends from the undersurface 3 to the uppersurface 4. From the undersurface 3 projects a resillent pad 6, while a rear lip 7 and side lips 8 project from the uppersurface 4. The seal 1 is preferably a one-piece polyurethane moulding.

In Figures 3 to 5 is illustrated a mineral cutter pick 9 having an enlarged head 10 and a shank 11, the latter being inserted into an aperture 12 in a pick box 13 adapted to be secured by welding, in the well known manner, to a rotary cutting head, e.g. of a mine roadway driving machine, or a mineral winning machine, with a retention seal 1 interposed between the pick and box. The pick shank 11 is retained by an arcuate and inclined axis recess 14 being engaged, in the known manner, by the arcuate periphery of a pin 15 partially located within the aperture 12. The aperture 5 in the base 2 of the seal 1 is so shaped as to be an interference fit for the particular cross-sectional shape fo the shank 11, e.g. rectangular, circular, square. The seal 1 is fitted over the shank 11 with the lips 7 and 8 embracing adjacent rear and side portions of the enlarged head 9. Initially, the shank 11 is inserted axially into the aperture 12 with shank surface 16 adjacent apertured surface 17. The pick is then moved rearwardly to engage the recess 14 with the pin 15 to achieve pick retention. Such rearward movement spacing the surfaces 16 and 17 and thereby creating a void 18 of rectangular section in the embodiment illustrated. It follows that the pad 6 is of similar cross-section so as to fill, or to fill substantially, the upper end of the void 18 as shown in Figures 3 to 5, for the void 18 will slightly increase in area when new, replacement picks are fitted to worn pick boxes.

CLAIMS

1. A retention seal for interposing between a

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mineral cutter pick, having a shank and an enlarged head, and an apertured box, the seal having a generally planar base provided with a hole extending from an undersurface of the base to an upper surface of the base, and serving, in use, to fit closely around the pick shank adjacent the enlarged head, and a resilient pad projecting away from the undersurface of the base and serving, in use, to snap into a void defined between the pick shank and a front of the box aperture after the shank has been moved rearwardly to cause interaction of co-operating elements to retain the pick within the aperture of the box.

2. A retention seal as claimed in Claim 1, provided with a lip or lips for embracing the rear and/or side portions of the enlarged head adjacent the shank.

3. A retention seal claimed in Claim 1 or Claim 2, bonded to the enlarged head.

4. A retention seal as claimed in any preceding Claim, of synthetic plastics material.

5. A retention seal as claimed in any preceding Claim formed as a one pice moulding.

6. A retention seal for interposing between a mineral cutter pick, having a shank and an enlarged head, and an apertured box, substantially as hereinbefore described with reference to Figures 1 and 2 of the accompanying drawings.

7. A mineral cutter pick provided with a seal as defined in any one of Claims 1 to 6.

8. A mineral cutter pick substantially as hereinbefore described with reference to Figures 3 to 5 of the accompanying drawings.

9. A mineral cutter pick and box combination provided with a seal as defined in any one of Claims 1 to 7.

10. A mineral cutter pick and box combination substantially as hereinbefore described with reference to Figures 3 to 5 of the accompanying drawings.

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